

REMARKS

The Applicant respectfully requests reconsideration in view of the following remarks and amendments. Claims 1, 8, and 13 have been amended. Claims 2 and 17 were previously cancelled. No claims have been added. Accordingly, claims 1, 3-16, and 18-20 are pending in the Application.

I. Claim Objections

In the outstanding Action, claim 8 is objected to as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. In response, claim 8 has been amended to refer to claims 6 and 7 in the alternative as directed by the Examiner. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the objection to claim 8 on this basis.

II. Claim Rejections – 35 U.S.C. §102

In the outstanding Action, claims 1, 3-16 and 18-20 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent Publication No. 2002/0077627 filed by Johnson *et al.* (“Johnson ‘627’”)

In regards to claim 1, this claim has been amended to recite

“A device for treating a volume of biological tissue by localized hyperthermia, the device including a plurality of active percutaneous electrodes (1-N), at least one return electrode (120), and a high frequency electricity generator (100) suitable for applying an alternating voltage between the active electrodes (1-N) and the return electrode (120),wherein the generator (100) is suitable for feeding each active electrode (1-N) independently of the others including means (20) for adjusting the amplitude of the voltage applied to each active electrode (1-N) and phase differences between the voltages applied by the electrodes, such that the parameters of the voltage and the phase applied to each active electrode is adjusted in an independent manner, thus generating electric currents propagating between the active electrodes (1-N) within the volume of biological tissue and causing necroses of the biological tissue” (emphasis added).

These amendments are supported, for example, by page 13, lines 3 and 4 and page 16, lines 11-13 of the Specification as filed. The Applicants submit that neither Johnson ‘627 nor Deng

teaches these elements of amended claim 1.

A. Johnson ‘627

Johnson ‘627 discloses an impedance monitoring and treatment apparatus 10 that is configured to deliver two types of signals to tissue: (1) a first low power sensing or excitation signal 20e having a first frequency, wherein said first signal measures electrical parameters, such as impedance of the target tissue, and (2) a second high power treatment signal 20t having a second frequency, wherein said second signal performs tissue ablation. See Johnson ‘627, Paragraph [0059].

With respect to the first signal, this signal is used for performing measurement and is not sufficient to cause necroses of biological tissue. The apparatus of Johnson ‘627 controls the power delivered to tissue while measuring parameters of the tissue, such as impedance. The measured impedance includes a phase shift between the voltage and current. See Johnson ‘627, Paragraph [0051]. However, Johnson ‘627 fails to teach each element of amended claim 1 for at least the reasons provided below.

Firstly, in Johnson ‘627, the disclosed “phase shift” is not linked with electric currents used to cause necroses of the biological tissue (i.e. the second high power treatment signal 20t), because Johnson ‘627 only discloses that the power and frequency of the treatment signal 20t are only controlled, not the “phase shift.” Moreover, in Johnson ‘627 the “phase shift” between the voltage and current is a measured parameter which depends on the characteristics of the tissue and not on the applied signal. This “phase shift” allows characterization of the tissue. Therefore, this “phase shift” is not adjusted by the apparatus 10 of Johnson ‘627. Instead, Johnson ‘627 explicitly discloses that the changes in voltage and current are independent of the power delivered by the apparatus. See Johnson ‘627, Paragraphs [0101] and [0201]. Thus, Johnson ‘627 fails to disclose “adjusting...phase differences between the voltages applied by the electrodes, such that the parameters of the voltage and the phase applied to each active electrode is adjusted in an independent manner, thus generating electric currents propagating between the active electrodes (1-N) within the volume of biological tissue and causing necroses of the biological tissue” as recited in amended claim 1, because Johnson ‘627 does not adjust a phase shift to cause necroses of the biological tissue. As illustrated in Figures 8 and 9 of the current

application, the claimed device allows modification of the shape of the necroses without the need for re-positioning the electrodes. By failing to teach the above noted elements of claim 1, Johnson '627 does not allow modification of the shape of the necroses without the need for re-positioning the electrodes.

Secondly, the phase shift as disclosed by Johnson '627 is a phase shift between a measured voltage and a current and not a phase difference between the voltages applied by the electrodes as recited in amended claim 1.

Therefore, for at least the reasons discussed above, Johnson '627 fails to teach each elements of amended claim 1 and cannot maintain a rejection under 35 U.S.C. § 102. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection of this claim on this basis.

In regards to claim 13, this claim has been amended to include elements analogous to those of claim 1. For at least the reasons discussed above in regard to the 35 U.S.C. § 102 rejection of claim 1, Johnson '627 does not disclose these elements of claim 13. Thus, Johnson '627 does not teach each element of amended claim 13. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection of this claim.

Claims 3-12, 14-16, and 18-20 depend from independent claims 1 and 13, respectively, and incorporate the limitations thereof. Thus, for at least the reasons discussed above in regard to independent claims 1 and 13, Johnson '627 does not teach each of the elements of these claims. Accordingly, reconsideration and withdrawal of the anticipation rejection of these claims is requested.

B. Deng

In regards to Deng, the Examiner alleges that the antenna structures 20 of Deng are responsible for generating electric leak current and can be reasonably interpreted as the electrodes of claim 1. See Final Office Action, Pages 4 and 5. However, it is clear from Deng that such currents are interfering currents which are not sufficient for causing necroses of biological tissue as recited in amended claim 1. See Deng, Column 5, Line 65 through Column 6,

Line 5. Contrary to the Examiner's allegations, Deng instead explains that such leak currents must be avoided. Thus, Deng teaches away from the claimed electrodes.

Further, since Deng teaches away from leak currents, Deng also does not disclose adjusting voltage and phase differences of these currents so as to cause necroses of the biological tissue as recited in amended claim 1. As illustrated in Figures 8 and 9 of the current application, the claimed device allows modification of the shape of the necroses without the need for re-positioning the electrodes. By failing to teach the above noted elements of claim 1, Deng does not allow modification of the shape of the necroses without the need for re-positioning the electrodes.

Therefore, for at least the reasons discussed above, Deng fails to teach each elements of amended claim 1 and cannot maintain a rejection under 35 U.S.C. § 102. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection of this claim on this basis.

In regards to claim 13, this claim has been amended to include elements analogous to those of claim 1. For at least the reasons discussed above in regard to the 35 U.S.C. § 102 rejection of claim 1, Deng does not disclose these elements of claim 13. Thus, Deng does not teach each element of amended claim 13. Accordingly, the Applicants respectfully request reconsideration and withdrawal of the rejection of this claim.

Claims 3-12, 14-16, and 18-20 depend from independent claims 1 and 13, respectively, and incorporate the limitations thereof. Thus, for at least the reasons discussed above in regard to independent claims 1 and 13, Deng does not teach each of the elements of these claims. Accordingly, reconsideration and withdrawal of the anticipation rejection of these claims is requested.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending are now in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666. Questions regarding this matter should be directed to the undersigned at (310) 207-3800.

Respectfully submitted,

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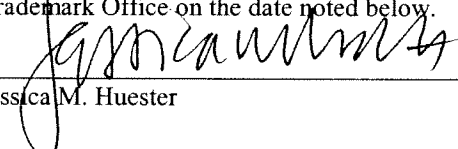
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